



# UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE  
United States Patent and Trademark Office  
Address: COMMISSIONER FOR PATENTS  
P.O. Box 1450  
Alexandria, Virginia 22313-1450  
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/027,195	12/20/2001	Daniel Tunkelang	109878-125	9651

23483 7590 05/21/2004

HALE AND DORR, LLP  
60 STATE STREET  
BOSTON, MA 02109

EXAMINER

LE, MIRANDA

ART UNIT

PAPER NUMBER

2177

DATE MAILED: 05/21/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

## Office Action Summary

**Application No.**

10/027,195

**Applicant(s)**

TUNKELANG, DANIEL

**Examiner**

Miranda Le

**Art Unit**

2177

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 24 March 2004.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 1-39 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-39 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
  - ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- |  |   |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)  | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)   | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152)             |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)<br>Paper No(s)/Mail Date <u>8</u> . | 6) <input type="checkbox"/> Other: _____  |

### **DETAILED ACTION**

1. This communication is responsive to Amendment , filed 1/22/2003.
2. Claims 1-11 are pending in this application. Claims 1, 4-9 are independent claims. In the Amendment A, claims 10-11 have been added, and claims 1-9 have been amended. This action is made Final.

The objection to the specification (specification, drawings) of the invention has been withdrawn in view of the amendment.

#### ***Claim Objections***

3. Claim 33 is objected to because of the following informalities: The status of claim 33 should be listed as “(currently amended)”, instead of “(original)”. Appropriate correction is required.

#### ***Claim Rejections - 35 USC § 102***

4. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

5. Claims 1-13, 15-23, 26, 31, 33-34, 38 are rejected under 35 U.S.C. 102(b) as being anticipated by Fish et al. (US Patent No. 6,035,294).

Fish anticipated independent claims 1, 31, 33, 38, by the following:

Art Unit: 2177

**As to claims 1, 33,** Fish teaches “a method for searching a collection of items, wherein each item in the collection has a set of properties, comprising the steps of: obtaining a query composed of a first set of one or more properties” at col. 4, lines 1-42, col. 6, lines 21-61;

“obtaining a result based on applying a distance function to the query and an item in the collection having a second set of one or more properties” at col. 4, lines 1-42, col. 5, lines 26-55, col. 6, lines 21-61, col. 9, lines 1-59, Figs. 3B-C,

“wherein obtaining a result includes determining a third set of properties common to the first set of one or more properties and the second set of one or more properties” at col. 4, lines 1-42, col. 6, lines 1-19, col. 9, lines 1-59, col. 5, lines 47-67,

“the distance function determines a distance between the query and an item in the collection based on the number of items in the collection that are associated with all of the properties in the third set of properties” at col. 4, lines 1-42, col. 5, lines 46-56, col. 9, line 1 to col. 10, line 31, Figs. 3B-C.

**As per claim 31,** Fish teaches “a method for analyzing two sets of properties from a plurality of sets of properties, comprising the steps of: determining a set of properties common to the two sets of properties” at col. 4, lines 1-42, col. 6, lines 21-61, col. 9, lines 1-59;

“determining the number of sets of properties from the plurality of sets of properties that include the set of common properties” at col. 4, lines 1-42, col. 9, lines 1-59;

“assessing the distance between the two sets of properties as a function of the number of sets of properties that include the set of common properties” at col. 9, lines 1-59, col. 4, lines 1-42, col. 6, lines 21-61.

Art Unit: 2177

**As per claim 38**, Fish teaches “a computer system for managing data records comprising: an information retrieval subsystem that stores and retrieves data records, each data record being associated with a set of properties” at col. 4, lines 1-42, col. 6, lines 1-21;

“a similarity search subsystem that receives similarity search queries and processes similarity search queries based on a distance function, a similarity search query being associated with a first set of properties” at col. 4, lines 1-42, col. 6, lines 1-21;

“wherein the distance function determines a distance between the query and a data record in the collection having a second set of properties based on determining a third set of properties common to the first set of properties and the second st of properties” at col. 9, lines 1-59, col. 6, lines 21-61,

“determining the number of data records in the collection that are associated with all of the properties in the third set of properties” at col. 9, lines 1-59, col. 4, lines 1-42, col. 6, lines 1-61.

**As per claim 2**, Fish teaches “the step of associating each item in the collection with a set of properties” at col. 4, lines 28-64, col. 5, line 4 to col. 6, line 61, col. 10, lines 6-31.

**As per claim 3**, Fish teaches “the step of obtaining a result includes identifying one or more result items whose distance from the query is within a first threshold” at col. 10, lines 6-48, col. 5, lines 47-61.

Art Unit: 2177

**As per claim 4**, Fish teaches “the step of obtaining a result includes ranking the one or more result items according to their distance from the query” at col. 6, lines 1-9, col. 5, lines 47-67.

**As per claim 5**, Fish teaches “the threshold is defined as a number of result items” at col. 6, lines 1-9, col. 5, lines 47-67.

**As per claim 6**, Fish teaches “the threshold is defined as a distance” at col. 6, lines 1-9, col. 5, lines 47-67.

**As per claim 7**, Fish teaches “the step of returning the result” at col. 6, lines 1-9, col. 5, lines 47-67, col. 4, lines 3-27, Fig. 2.

**As per claim 8**, Fish teaches “the step of obtaining a query includes the step of mapping a received query to a set of one or more properties” at col. 4, lines 3-27, col. 6, lines 39-61.

**As per claim 9**, Fish teaches “one or more of the properties are binary” at col. 7, lines 9-27.

**As per claim 10**, Fish teaches “one or more of the properties are related by a partial order, and wherein, if an item is associated with a property, then the item is also associated with all ancestors of that property in the partial order” at col. 4, lines 28-64, Figs. 3B-C.

**As per claim 11**, Fish teaches “one or more of the properties represent numerical values or ranges, and wherein the partial order reflects a set of containment relationships among the numerical values or ranges” at col. 8, lines 16-27.

**As per claim 12**, Fish teaches “the properties are grouped into equivalence classes” at col. 4, lines 28-64, Figs. 3B-C.

**As per claim 13**, Fish teaches “the step of grouping the properties into equivalence classes using clustering” at col. 4, lines 28-64, Figs. 3B-C.

**As per claim 15**, Fish teaches “the query corresponds to a single item in the collection” at col. 4, lines 28-65, col. 10, lines 6-31.

**As per claim 16**, Fish teaches “the query corresponds to a plurality of items in the collection” at col. 4, lines 28-65, col. 10, lines 6-31.

**As per claim 17**, Fish teaches “the query is independent of the items in the collection” at col. 4, lines 28-65, col. 10, lines 6-31.

**As per claim 18**, Fish teaches “the step of obtaining a result is constrained to a subcollection of the items in the collection” at col. 5, lines 6-46, col. 10, lines 6-31.

Art Unit: 2177

**As per claim 19**, Fish teaches “the subcollection is specified as an expression of properties” at col. 5, lines 6-46, col. 9, lines 12-49, Figs. 5G-I.

**As per claim 20**, Fish teaches “the expression includes a subset of the set of properties that compose the query” at col. 5, lines 6-46, col. 6, lines 39-61, col. 10, lines 6-37.

**As per claim 21**, Fish teaches “the step of obtaining a query includes identifying certain properties to be ignored in the step of obtaining a result” at col. 10, lines 6-37, at col. 5, lines 6-46.

**As per claim 22**, Fish teaches “the distance function is applied explicitly” at col. 5, lines 6-46.

**As per claim 23**, Fish does not expressly teach “the distance function is applied implicitly” at col. 5, lines 6-46.

**As per claim 26**, Fish teaches “the step of obtaining a result includes iterating through one or more subsets of the query and identifying items associated with the one or more subsets” at col. 5, lines 6-46, col. 9, lines 59 to col. 10, line 31.



Art Unit: 2177

As per claim 34, Fish teaches “the instructions cause the computer to obtain a result by identifying exactly the items whose distance from the query is within a threshold” at col. 10, lines 6-48, col. 5, lines 47-61.

6. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless:

(e) the invention was described in

(1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or

(2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

7. Claim 32 is rejected under 35 U.S.C. 102(e) as being anticipated by Wical et al. (US Patent No. 6,038,560).

Wical anticipated independent claim 32 by the following:

As per claim 32, Wical teaches “a method for analyzing the relationship between two items in a collection of items, wherein each item in the collection is associated with a set of properties, comprising the steps of obtaining a set of properties with which the two items are commonly associated” at col. 9, line 54 to col. 10, line 35, col. 17, lines 39-61;

“determining the degree of commonality between the two items as a function of the number of items in the collection that are associated with all of the properties with which

Art Unit: 2177

the two items are commonly associated” at col. 9, line 54 to col. 10, line 35, col. 12, lines 18-45, col. 17, lines 39-61.

***Claim Rejections - 35 USC § 103***

8. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

9. Claims 14, 24-25, 27-30, 35-37, 39 are rejected under 35 U.S.C. 103(a) as being unpatentable over Fish et al. (US Patent No. 6,035,294), in view of Kortge et al. (US Patent No. 6,446,068 B1).

**As per claim 14**, Fish does not explicitly teach “each property has a set of subproperties, wherein the clustering is performed such that the distance between two properties in the collection is correlated to the number of properties in the collection that are associated with all of the subproperties common to both properties”. However, Kortge teaches this limitation at col. 7, line 26 to col. 8, line 53.

It would have been obvious to one of ordinary skill in the art at the time of the invention to modify the teachings of Fish with the teachings of Kortge to include “each property has a set of subproperties, wherein the clustering is performed such that the distance between two properties in the collection is correlated to the number of properties in the collection that are associated with all of the subproperties common to both properties” in order to provide a search method which finds a near neighbor to a query with fewer distance computations and can make use of previous search result to speed up subsequent searches on similar queries.

**As per claim 24**, Fish does not specifically teach “the step of obtaining a result includes the step of iterating a random walk process to select potential result items”. However, Kortge teaches this limitation at col. 10, lines 49-61, col. 14, lines 46-54.

It would have been obvious to one of ordinary skill in the art at the time of the invention to modify the teachings of Fish with the teachings of Kortge to include “the step of obtaining a result includes the step of iterating a random walk process to select potential result items” in order to provide a search method which finds a near neighbor to a query with fewer distance computations and can make use of previous search result to speed up subsequent searches on similar queries.

**As per claim 25**, Fish teaches “the step of obtaining a result includes ranking the potential result items by frequency and selecting the potential result items having higher frequencies” at col. 5, lines 6-46, col. 9, lines 59 to col. 10, line 31.

Art Unit: 2177

As per claim 27, Fish does not explicitly teach “the one or more subsets are prioritized according to the number of items in the collection that have all of the properties in each subset and wherein iterating through one or more subsets of the query is continued until a first threshold is reached”. However, Kortge teaches this limitation at col. 6, lines 26-46.

Thus, it would have been obvious to one of ordinary skill in the art at the time of the invention to modify the teachings of Fish with the teachings of Kortge to include “the one or more subsets are prioritized according to the number of items in the collection that have all of the properties in each subset and wherein iterating through one or more subsets of the query is continued until a first threshold is reached” in order to provide a search method which finds a near neighbor to a query with fewer distance computations and can make use of previous search result to speed up subsequent searches on similar queries.

As per claim 28, Fish does not expressly teach “the step of obtaining a result includes applying a Euclidean distance function”. However, Kortge teaches this limitation at col. 8, lines 7-12.

It would have been obvious to one of ordinary skill in the art at the time of the invention to modify the teachings of Fish with the teachings of Kortge to include “the step of obtaining a result includes applying a Euclidean distance function” in order to provide a search method which finds a near neighbor to a query with fewer distance computations and can make use of previous search result to speed up subsequent searches on similar queries.

**As per claim 29**, Kortge teach “the step of obtaining a result includes merging a first result determined by applying the distance function and a second result determined by applying the Euclidean distance function” at col. 8, lines 5-12.

**As per claim 30**, Kortge teaches “the step of obtaining a result includes determining a first result by applying either the distance function or the Euclidean distance function and applying the other distance function to the first result” at col. 8, lines 5-12.

**As per claim 35**, Fish does not expressly teach “the instructions cause the computer to obtain a result by identifying approximately the items whose distance from the query is within a threshold according to a heuristic”. However, Kortge teaches this limitation at col. 6, lines 27-46.

Thus, it would have been obvious to one of ordinary skill in the art at the time of the invention to modify the teachings of Fish with the teachings of Kortge to include “the instructions cause the computer to obtain a result by identifying approximately the items whose distance from the query is within a threshold according to a heuristic” in order to provide a search method which finds a near neighbor to a query with fewer distance computations and can make use of previous search result to speed up subsequent searches on similar queries.

**As per claim 36**, Kortge teaches “the heuristic permits a trade-off between the accuracy and the performance of a search” at col. 6, lines 27-46.

As per claim 37, Kortge teaches “the heuristic includes the use of a random walk process” at col. 10, lines 49-61, col. 14, lines 46-54.

As per claim 39, Fish does not specifically teach “a clustering subsystem that employs the distance function of the similarity search subsystem to construct a graph”. However, Kortge teaches this limitation at col. 9, lines 10-15, Fig. 5.

It would have been obvious to one of ordinary skill in the art at the time of the invention to modify the teachings of Fish with the teachings of Kortge to include “a clustering subsystem that employs the distance function of the similarity search subsystem to construct a graph” in order to provide a search method which finds a near neighbor to a query with fewer distance computations and can make use of previous search result to speed up subsequent searches on similar queries.

### ***Response to Arguments***

10. Applicant's arguments regarding Wical does not disclose the amended claimed limitations such as “obtaining a result based on applying a distance function to the query and an item in the collection having a second set of one or more properties; wherein obtaining a result includes determining a third set of properties common to the first set of one or more properties and the second set of one or more properties; the distance function determines a distance between the query and an item in the collection based on the number of items in the collection that are associated with all of the properties in the third set of properties” with respect to claims 1, 31, 33, 38 have been considered, but are moot in view of the new ground(s) of rejection.

Art Unit: 2177

*Conclusion*

11. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than **SIX MONTHS** from the date of this final action.

The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Miranda Le whose telephone number is (703) 305-3203. The examiner can normally be reached on Monday through Friday from 8:30 AM to 5:00 PM.


If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, John E. Breene, can be reached on (703) 305-9790. The fax number to this Art Unit is (703) 872-9306.

Any inquiry of a general nature or relating to the status of this application should be directed to the Group receptionist whose telephone number is (703) 305-3900.

*ml*

Miranda Le

May 16, 2004

  
GRETA ROBINSON  
PRIMARY EXAMINER